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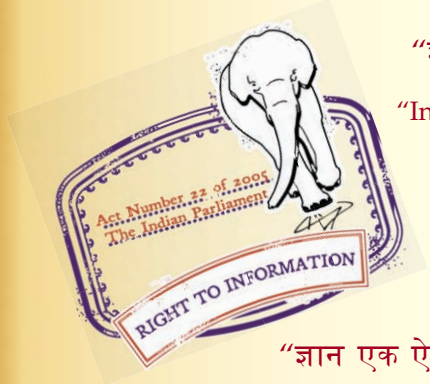
IS 5350-3 (1971): Dimensions of Indoor and Outdoor Porcelain Post Insulators and Post Insulator Units for Systems with Nominal Voltages Greater Than 1000 V, Part III: Outdoor Pedestal Post Insulators [ETD 6: Electrical Insulators and Accessories]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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: 5350 (Part III) - 1971
(Reaffirmed 1977)

Indian Standard

DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1 000 V

PART III OUTDOOR PEDESTAL POST INSULATORS

Second Reprint MARCH 1984
(Incorporating Amendment No 1)

UDC 621·315·623·5

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 4 *March* 1972

AMENDMENT NO. 3 NOVEMBER 1991
TO
IS 5350 (Part 3) : 1971 DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATORS UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1 000 V

PART 3 OUTDOOR PEDESTAL POST INSULATORS

(*Page* 8, *Table* 1, *col* 11, 12th *entry*) — Substitute '447' *for* '457'.

(*Page* 12, *Table* 5, *col* 6, 9th *entry*) — Substitute '1 350' *for* '2 250'.

(*Page* 13, *Table* 5, *col* 6, *last but one entry*) — Substitute '8 500' *for* '8 400'.

(ET 06)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 APRIL 1982

TO

IS:5350(Part III)-1971 DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1 000 V

PART III OUTDOOR PEDESTAL POST INSULATORS

Corrigendum

(*Page 8, Table 1, col 10, heading*) - Substitute 'HEIGHT OF UNIT (TOLERANCE ± 1 mm)' *for* 'HEIGHT OF UNIT (± 1 *Min*)'.

(ETDC 3)

Reprography Unit, ISI, New Delhi, India

IS : 5350 (Part III) - 1971
(Reaffirmed 1977)

Indian Standard

DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1 000 V

PART III OUTDOOR PEDESTAL POST INSULATORS

(*Continued on page 2*)

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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(*Continued from page* 1)

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Indian Standard

DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1 000 V

PART III OUTDOOR PEDESTAL POST INSULATORS

0. FOREWORD

0.1 This Indian Standard (Part III) was adopted by the Indian Standards Institution on 13 September 1971, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard is intended to establish standard values of those electrical characteristics, mechanical characteristics and dimensions that are essential to the interchangeability of post insulators and post insulator units made by different manufacturers.

NOTE — General definitions and methods of tests of post insulators are covered by IS : 2544-1963*.

0.3 This standard covers three types of post insulators in the following three parts:

Part I Indoor post insulators,

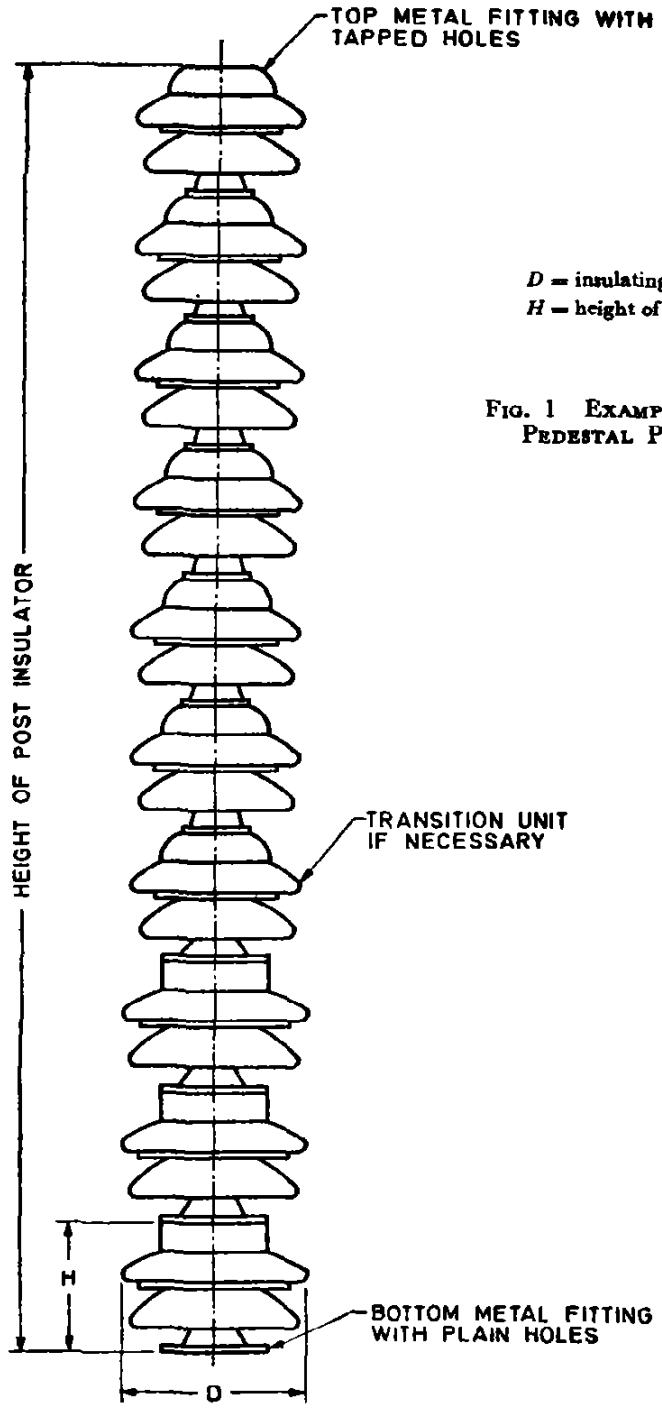
Part II Outdoor cylindrical post insulators, and

Part III Outdoor pedestal post insulators.

0.3.1 The three types of insulators are distinguished by their electrical, mechanical and dimensional characteristics. Figure 1 illustrates typical example of outdoor pedestal post insulator. This drawing is only general illustration and other shapes and constructions are permitted.

0.4 In the preparation of this standard, assistance has been derived from the IEC Publication 273 (1968) ' Dimensions of indoor and outdoor post insulators and post insulator units for systems with nominal voltages greater than 1 000 V ' issued by the International Electrotechnical Commission.

*Specification for porcelain post insulators (3·3 kV and above).



D = insulating part diameter
H = height of one unit

FIG. 1 EXAMPLE OF A 10 UNIT PEDESTAL POST INSULATOR

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part III) applies to pedestal type post insulator and post insulator units of ceramic materials intended for outdoor service in electrical installations or equipment operating on alternating current with a rated voltage greater than 1 000 V and a frequency not greater than 100 Hz. The insulators covered by this standard are primarily intended for use in isolators (disconnectors) or as bus bar or as fuse supports.

2. ELECTRICAL CHARACTERISTICS

2.1 Each post insulator is designed to meet a specified impulse withstand voltage in accordance with IS : 2544-1963†. The corresponding power frequency wet withstand voltages are also given. The system voltage is not specified because it may be necessary to choose different insulators for a given system voltage depending on service conditions

3. MECHANICAL CHARACTERISTICS

3.1 Post insulators are standardized in mechanical strength classes based on values of the specified failing load in the bending test, chosen to conform as far as possible with current practice. Unless otherwise agreed, it is assumed that a post insulator is to be mounted in the upright position, that is, with the live end at the top. It is also assumed that the load is applied at the top surface. Where insulators are to be mounted underhung, the standard values of bending strength may not be applicable. Other positions of mounting (for example, horizontal) may also affect the strength if the weight of the post insulator is not negligible The appropriate strength rating for methods of mounting other than upright shall be subject to agreement between the manufacturer and the purchaser

3.2 The mechanical strength classes for outdoor pedestal post insulators are as follows:

Strength Class	*Newtons*
A	3 000 to 5 000
B	5 001 ,, 7 500
C	7 501 ,, 12 000
D	12 001 ,, 18 000
E	18 001 ,, 35 000
F	35 001 ,, 60 000
G	60 001 ,, 110 000

*Rules for rounding off numerical values (*revised*)

†Specification for porcelain post insulators (3·3 kV and above).

3.3 Mechanical strengths in tension, compression and torsion are also given in Table 1. For pedestal insulators, a failing load P_x may also be specified and will refer to a load applied at x mm above the top face of the insulator. The value of such loads shall be subject to agreement between the manufacturer and the purchaser.

4. DIMENSIONAL CHARACTERISTICS

4.1 The following dimensions for pedestal post insulators and post insulator units are specified:

a) Overall height,
b) Maximum diameter of the insulating part,
c) Fixing arrangements (*see* **6**), and
d) Minimum creepage distance.

4.2 The overall heights of post insulators specified in the standard have been chosen to permit the insulators to comply with the specified electrical characteristics when tested in accordance with IS : 2544-1963*.

4.2.1 When the arrangement of the insulator in service differs appreciably from the standard arrangement for test, the electrical characteristics under service conditions may be different. Exceptional cases may require special precautions or even the choice of a larger insulator.

4.3 The nominal dimensions of an insulator shall not be greater than the specified maximum or less than the specified minimum values. Actual dimensions of insulators are subject to manufacturing tolerances.

4.4 The minimum creepage distances specified are intended to cover the use of post insulators under normal conditions or slightly polluted conditions. The amount by which the creepage distance of the insulator may be increased within the specified dimensions varies according to the design and size of the insulator, and where increased creepage distance is required it should be the subject of agreement between the manufacturer and the purchaser in order to a 'oid designs which are unsuitable for service in polluted atmosphere.

5. REQUIREMENTS

5.1 The specified characteristics of the pedestal post insulator units and insulators are given in the following tables:

a) Pedestal post insulator units	Table 1
b) Bending strength in stacks	Table 2
c) Fixing arrangements	Table 3

*Specification for porcelain post insulators (3·3 kV and above).

5.2 To reduce the number of standard units, some ratings have been covered by the use of post insulators of higher ratings The guidance to the selection of insulators in such cases is given in Appendix A.

5.3 In tables which relate to complete post insulators, all insulators of the same impulse voltage rating are grouped together. In tables relating to post insulator units, the units are arranged with the type numbers in sequence

5.4 The basis of standardization of pedestal post insulators is the full specification of the units in Tables 1 and 2 Complete pedestal post insulators are composed of one or more of these standard units. For stacks of more than one unit, it is often possible to reach a given voltage and strength rating in a number of alternative ways. The alternative pedestal post insulators may differ in certain respects, such as stiffness, radio interference performance, etc, and it may be necessary to decide the most suitable composition of the post insulator by agreement between the manufacturer and the purchaser. Examples of combinations of units to form pedestal post insulators are given in Appendix A. other combinations are also possible.

6. FIXING ARRANGEMENTS

6.1 The fixing arrangements of standard post insulators and post insulator units shall be in accordance with Table 3. Fixing holes shall be equally spaced on the appropriate pitch circle, which shall be concentric with the axis of the insulator. Holes in top and bottom fittings shall be in line unless otherwise specified, and they shall be so arranged as to permit the use of normal hexagon bolt heads and nuts. The tapped holes shall be of standard size except that the diameter may be oversize by not more than 0·25 mm. They shall be suitable for steel bolts having standard dimensions after galvanizing. The length of full thread shall be not less than the nominal bolt diameter The threads of tapped holes in galvanized fittings shall be cut after galvanizing Standard insulators shall have threads according to IS 4218-1967*. To assist interchangeability fixing bolts may be supplied with each post insulator if specified by the purchaser at the time of placing the orders.

7. DESIGNATION OF POST INSULATORS

7.1 Each standard post insulator is assigned a reference symbol which indicates the type of insulator The symbol for outdoor pedestal post insulator is 'P' and for outdoor pedestal post insulator unit 'E'.

*ISO metric screw threads.

TABLE 1 PEDESTAL POST INSULATOR UNITS

[*Clauses* 5.1 (a) *and* 5.4]

Post Insulator Unit Designation	Impulse Withstand Voltage	Power Frequency Withstand Voltage (Wet)	Creepage Distance *Min*	Failing Load					Height of Unit (±1 *Min*)	Insulating Part Dia *Max*	Top Metal Fitting Pitch Circle Dia	Bottom Metal Fitting Pitch Circle Dia
				Bending		Tension	Compression	Torsion				
				Upright	Underhung							
	kV	kV	mm	N	N	N	N	Nm	mm	mm	mm	mm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	E20	60	27	130	5 000	3 000	15 000	30 000	200	190	176	57	57
	E21	75	35	230	5 000	3 000	15 000	30 000	200	254	152	57	57
	E22	75	35	230	9 000	4 500	20 000	40 000	340	254	202	57	57
	E30	60	27	130	9 000	4 500	20 000	40 000	225	190	176	76	76
	E31	75	35	230	9 000	4 500	20 000	40 000	340	254	202	76	76
	E32	125	55	380	9 000	6 800	30 000	40 000	680	254	210	76	76
	E33	170	75	580	9 000	4 500	20 000	40 000	1 100	381	330	76	76
	E50	60	27	130	18 000	13 500	30 000	60 000	1 350	203	228	127	127
	E51	75	35	230	18 000	13 500	30 000	60 000	1 350	254	254	127	127
	E52	125	55	380	18 000	13 500	30 000	60 000	1 350	254	305	127	127
	E53	170	75	580	18 000	13 500	50 000	1 00 000	2 250	381	356	127	127
	E54	170	75	840	31 000	18 000	60 000	1 20 000	4 500	368	457	127	127
	E55	170	75	840	59 000	32 000	80 000	1 60 000	8 500	368	457	127	127
	E70	170	75	840	59 000	32 000	80 000	1 60 000	8 500	368	457	178	178
	E100	170	75	840	1 07 000	67 000	1 50 000	3 00 000	11 700	368	495	254	254

AMENDMENT NO. 2 APRIL 1982

TO

IS:5350(Part III)-1971 DIMENSIONS OF INDOOR AND OUTDOOR PORCELAIN POST INSULATORS AND POST INSULATOR UNITS FOR SYSTEMS WITH NOMINAL VOLTAGES GREATER THAN 1 000 V

PART III OUTDOOR PEDESTAL POST INSULATORS

Corrigendum

(*Page 8, Table 1, col 10, heading*) - Substitute 'HEIGHT OF UNIT (TOLERANCE ± 1 mm)' *for* 'HEIGHT OF UNIT (± 1 *Min*)'.

(ETDC 3)

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TABLE 2 PEDESTAL POST INSULATOR UNITS BENDING STRENGTH IN STACKS

[*Clauses* 5.1(b) *and* 5.4]

Post Insulator Unit Designation → / Units in Stack ↓	E32	E52	E53	E54	E55	E70	E100
	Minimum Failing Load in Upright Bending Test in Newtons (N)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2	4 500	7 600	7 600	13 300	22 300	22 300	40 000
3		4 500	4 500	7 600	12 400	12 400	29 000
4		3 300	3 300	5 300	8 900	8 900	20 000
5				4 000	6 700	6 700	15 500
6				3 300	5 300	5 300	12 400
7					4 450	4 450	10 200
8					4 000	4 000	8 900
9						3 400	7 600
10						3 000	6 700
11							6 000
12							5 500

NOTE — This table is based on stacks of identical units In stacks composed of units having different heights and bending strengths account shall be taken of these differences in calculating strength of the complete post insulator

TABLE 3 STANDARD FIXING ARRANGEMENTS OF PEDESTAL TYPE OUTDOOR POST INSULATORS

[*Clauses* 5.1(c) *and* 6.1]

Pitch Circle Diameter	No. of Bolts	Bolt Holes		Nominal Diameter of Mounting Face not to Exceed
		Tapped	Plain	
(1)	(2)	(3)	(4)	(5)
mm		mm	mm	mm
57	4	10	12	85
76	4	12	15	115
127	4	16	18	165
178	4	20	22	225
254	8	20	22	300

NOTE — For further information on the fixing arrangements, *see* **6**.

7.2 Strength Class — The outdoor pedestal post insulators are classified into the following strength classes:

A, B, C, D, E, F and G

7.2.1 The mechanical strength for these classes has been indicated in **3.2.**

7.3 Impulse Withstand Voltage — The impulse withstand voltage values for outdoor pedestal post insulators are 45 to 1 550 kV (in accordance with IS : 2544-1963*).

Example:

'IS post insulator type PD — 1 050' indicates a pedestal post insulator of strength class D and impulse withstand voltage 1 050 kV.

NOTE — The designation does not always fully specify the insulator, as sometimes alternative constructions are included in the standard, for example, the pedestal post insulators may be of various composition

APPENDIX A

(*Clauses* 5.2 *and* 5.4)

GUIDE TO SELECTION AND COMPOSITION OF OUTDOOR PEDESTAL POST INSULATORS

A-0. The standard units of pedestal post insulators have been covered in Tables 1 and 2 and complete pedestal post insulators are generally composed of one or more of these standard units. In this appendix, the guidance has been provided to select the various combinations of standard pedestal post insulator units to obtain the required electrical, mechanical and dimensional characteristics Table 4 gives the choice of the pedestal post insulators for required withstand voltages, Table 5 gives the composition of the same.

*Specification for porcelain post insulators (3·3 kV and above).

TABLE 4 GUIDE TO SELECTION OF PEDESTAL POST INSULATOR

(*Clause* A-0)

Required Withstand Voltage		Required Mechanical Strength Class						
Impulse kV	Power Frequency (Wet) kV	Class A 3 000-5 000N	Class B 5 001-7 500N	Class C 7 501-12 000N	Class D 12 001-18 000N	Class E 18 001-35 000N	Class F 35 001-60 000N	Class G 60 001-110 000N
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
45	21	PA 60	PC 60	PC 60	PD 60	PE 170	PF 170	PG 170
60	27	PA 60	PC 60	PC 60	PD 60	PE 170	PF 170	PG 170
75	35	PA 75	PC 75	PC 75	PD 75	PE 170	PF 170	PG 170
125	55	PC 125	PC 125	PC 125	PD 125	PE 170	PF 170	PG 170
170	75	PA 170	PC 170	PC 170	PD 170	PE 170	PF 170	PG 170
325	140	PA 325	PC 325	PC 325	PD 325	PE 325	PF 325	—
550	230	PA 550	PC 550	PC 550	PD 550	PE 550	—	—
650	275	PA 650	PB 650	PC 650	PE 650	PE 650	—	—
1 050	460	PA 1 050	PB 1 050	PD 1 050	PD 1 050	—	—	—
1 550	680	PA 1 550	PB 1 550	—	—	—	—	—

NOTE — Details of examples of pedestal post insulators are given in Table 5.

TABLE 5 PEDESTAL POST INSULATOR COMPOSITION PA 60 — PB 1 550

(*Clause* A-0, and *Note of Table* 4)

Post Insulator Designation	Impulse Withstand Voltage	Power Frequency Withstand Voltage (Wet)	Creepage Distance, *Min*	Failing Load				Height of Post Insulator	Insulation Part Dia, *Max*	Top Metal Fitting Pitch Circle Dia	Bottom Metal Fitting Pitch Circle Dia	Composition
				Bending	Torsion	Tensile	Compression					
	kV	kV	mm	N	Nm	N	N	mm	mm	mm	mm	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
PA 60	60	27	130	5 000	200	15 000	30 000	190	176	57	57	1 E20
PC 60	60	27	130	9 000	225	20 000	40 000	190	176	76	76	1 E30
PD 60	60	27	130	18 000	1 350	30 000	60 000	203	228	127	127	1 E50
PA 75	75	35	230	5 000	200	15 000	30 000	254	152	57	57	1 E21
PC 75/1	75	35	230	9 000	340	20 000	40 000	254	202	57	57	1 E22
PC 75/2	75	35	230	9 000	340	20 000	40 000	254	202	76	76	1 E31
PD 75	75	35	230	18 000	1 350	30 000	60 000	254	254	127	127	1 E51
PC 125	125	55	380	9 000	680	30 000	40 000	254	210	76	76	1 E32
PD 125	125	55	380	18 000	2 250	30 000	60 000	254	305	127	127	1 E52
PA 170	170	75	760	4 500	680	30 000	40 000	508	210	76	76	2 E32
PC 170/1	170	75	760	7 600	2 250	30 000	60 000	508	305	127	127	2 E52
PC 170/2	170	75	580	9 000	1 100	20 000	40 000	381	330	76	76	1 E33
PD 170	170	75	580	18 000	2 250	50 000	1 00 000	381	356	127	127	1 E53
PE 170	170	75	840	31 000	4 500	60 000	1 20 000	368	447	127	127	1 E54
PF 170/1	170	75	840	59 000	8 500	80 000	1 60 000	368	457	127	127	1 E55
PF 170/2	170	75	840	59 000	8 500	80 000	1 60 000	368	457	178	178	1 E70
PG 170	170	75	840	1 07 000	11 700	1 50 000	3 00 000	368	495	254	254	1 E100

PA 325	325	140	1 140	4 500	2 250	30 000	60 000	762	305	127	127	3 E52
PC 325	325	140	1 160	7 600	2 250	50 000	1 00 000	762	356	127	127	2 E53
PD 325	325	140	1 680	13 300	4 500	60 000	1 20 000	736	447	127	127	2 E54
PI 325/1	325	140	1 680	22 300	8 500	80 000	1 60 000	736	457	127	127	2 E55
PI 325/2	325	140	1 680	22 300	8 500	80 000	1 60 000	736	457	178	178	2 E70
PT 325	325	140	1 680	40 000	11 700	1 50 000	3 00 000	736	495	254	254	2 E100
PC 550	550	230	2 520	7 600	4 500	60 000	1 20 000	1 104	447	127	127	3 E54
PD 550/1	550	230	2 520	12 400	8 500	80 000	1 60 000	1 104	457	127	127	3 E55
PD 550/2	550	230	2 520	12 400	8 500	80 000	1 60 000	1 104	457	178	178	3 E70
PL 550	550	230	2 520	29 000	11 700	1 50 000	3 00 000	1 104	495	254	254	3 E100
PA 650	650	275	2 320	3 300	2 250	30 000	1 00 000	1 524	356	127	127	4 E53
PB 650	650	275	3 360	5 300	4 500	60 000	1 20 000	1 472	447	127	127	4 E54
PC 650/1	650	275	3 360	8 900	8 500	80 000	1 60 000	1 472	457	127	127	4 E55
PC 650/2	650	275	3 360	8 900	8 500	80 000	1 60 000	1 472	457	178	178	4 E70
PE 650	650	275	3 360	20 000	11 700	1 50 000	3 00 000	1 472	495	254	254	4 E100
PA 1 050	1 050	460	5 040	3 300	4 500	60 000	1 20 000	2 208	447	127	127	6 E54
PB 1 050/1	1 050	460	5 040	5 300	8 500	80 000	1 60 000	2 208	457	127	127	6 E55
PB 1 050/2	1 050	460	5 040	5 300	8 500	80 000	1 60 000	2 208	457	178	178	6 E70
PD 1 050	1 050	460	5 040	12 400	11 700	1 50 000	3 00 000	2 208	495	254	254	6 E100
PA 1 550	1 550	680	8 400	3 000	8 400	80 000	1 60 000	3 680	457	178	178	10 E70
PB 1 550	1 550	680	8 400	6 700	11 700	1 50 000	3 00 000	3 680	495	254	254	10 E100

NOTE 1 – Stacking units are mounted on sub-bases as given below to provide full dry arcing distance, wherever necessary

SB-5 — Sub-base with 127 mm pitch circle diameter 89 mm high

SB-7 — Sub-base with 178 mm pitch circle diameter 89 mm high

SB-10 — Sub-base with 254 mm pitch circle diameter 89 mm high.

NOTE 2 — The height of the pedestal post insulators is choosen to ensure compliance with both wet power frequency and impulse withstand voltage according to IS 2544-1963* Many of the above post insulators would be suitable for higher impulse withstand voltage than those associated with the wet power frequency withstand voltage

*Specification for porcelain post insulators (3·3 kV and above)

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg m/s^2
Energy	joule	J	1 J = 1 N m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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Eastern : 5 Chowringhee Approach	CALCUTTA 700072	27 50 90
Southern : C. I. T Campus	MADRAS 600113	41 24 42
Northern : B69, Phase VII	S A.S. NAGAR (MOHALI) 160051	8 78 26

Branch Offices		
'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	22 48 05
Gangotri Complex, Bhadbhada Road, T T. Nagar	BHOPAL 462003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
5-8-56C L. N Gupta Marg	HYDERABAD 500001	22 10 [illegible]
R 14 Yudhister Marg, C Scheme	JAIPUR 302005	6 98
117/418 B Sarvodaya Nagar	KANPUR 208005	4 72 [illegible]
Patliputra Industrial Estate	PATNA 800013	6 28 08
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27

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